WHAT IS CLAIMED IS:

1. A multilayer lithographic structure comprising a substrate, having on a major surface thereof a first layer which comprises a water and/or aqueous base soluble material comprising Ge, O, and H, and optionally X, wherein X is at least one of Si, N, and F; and disposed on said first layer a second layer which comprises an energy photoactive material.

2. The lithographic structure of claim 1, wherein said substrate is selected from the group consisting of: a semiconductor, a dielectric, a polymer, a glass, a metal, nonmetallic conductor, magnetic material and any combinations thereof.

3. The lithographic structure of claim 1, wherein said energy photoactive material is selected from the group consisting of: compositions which are photosensitive to 248nm, 193nm, 157nm, 126nm and extreme ultraviolet radiation, electron beam, ion beam, x-ray irradiation and any combinations thereof.

4. The lithographic structure of claim 1, wherein said first layer comprises one or more of same or different layers comprising Ge, O, and H, and optionally X, wherein X is at least one of Si, N, and F.

5. The lithographic structure of claim 4, wherein said first layer has an index of refraction and an extinction coefficient that are finely tuned to substantially match those of said substrate at a first interface between said

first layer and said substrate and to substantially match those of said second layer at a second interface between said first layer and said second layer.

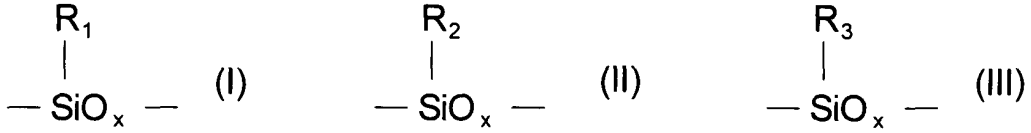
6. The lithographic structure of claim 5, wherein said index of refraction is tunable between from about 1.4 to about 2.6 and wherein said extinction coefficient is tunable from about 0.01 to about 0.78.

7. The lithographic structure of claim 1, wherein said first layer functions as a hardmask layer, an anti-reflection layer, or a combined hardmask/anti-reflection layer.

8. The lithographic structure of claim 1, wherein a third layer comprising an anti-reflective coating is interposed between said first layer and said second layer.

9. The lithographic structure of claim 8, wherein said anti-reflective coating comprises R, C, O, and H, wherein R is selected from the group consisting of: Si, Ge, Ti and any combinations thereof.

10. The lithographic structure of claim 9, wherein said anti-reflective coating comprises a polymer comprising one or more functional groups selected from the group consisting of:



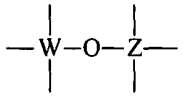
wherein x is from about 1 to about 1.5; R_1 comprises a chromophore moiety; R_2 comprises a transparent moiety; and R_3 comprises a reactive site for reaction with a crosslinking compound.

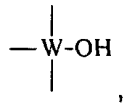
11. The lithographic structure of claim 1, wherein a fourth layer comprising a sacrificial hard mask and/or a capping layer is interposed between said first layer and said substrate.

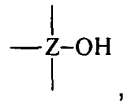
12. The lithographic structure of claim 1, wherein said first layer is deposited by a technique selected from the group consisting of: vapor deposition, plasma enhanced chemical vapor deposition, high density plasma, sputtering, ion beam, electron beam, laser assisted techniques and any combinations thereof.

13. The lithographic structure of claim 1, wherein said first layer is deposited from a precursor selected from the group consisting of: germane, alkyl germane, alkoxy germane, acyloxy germane, aryl germane, cyclic germane, silicon containing precursor, oxygen containing precursor, nitrogen containing precursor, fluorine containing precursor, sulfur containing precursor, carbon dioxide, carbon monoxide, hydrogen and any combinations thereof.

14. The lithographic structure of claim 1, wherein said first layer comprises a material which comprises a functional group represented by the formula:

a)  ,

b)  ,

c)  , or

d) any combinations thereof,

wherein W and Z are independently selected from the group consisting of: Ge, Si, N, and F.

15. The lithographic structure of claim 14, wherein said functional group b) and c) are present in a mole percent of less than about 5%.

16. The lithographic structure of claim 14, wherein said first layer is deposited by spin coating.

17. The lithographic structure of claim 14, wherein said first layer is deposited from a precursor selected from the group consisting of: $Ge(OR)_4$, $Si(OR)_4$, $HGe(R^1)_3$, $HSi(R^1)_3$, $HGe(OR)_3$, $HSi(OR)_3$ and any combinations thereof, wherein R is selected from the group consisting of: methyl, ethyl, isopropyl, isobutyl, n-butyl and any combinations thereof, and wherein R^1 is a halogen.

18. The lithographic structure of claim 1, wherein said first layer is patternable by reactive ion etching in a gas chemistry with an etch selectivity to said substrate that is greater than about 1:1.

19. The lithographic structure of claim 1, wherein said first layer comprises by atomic %: Ge from about 15 at.% to about 40 at.% ; O from about 15 at.% to about 85 at.%; H from about 5 at.% to about 55 at.%; X from about 0 at.% to about 50 at.%.

20. The lithographic structure of claim 1, wherein the optical, chemical, and physical properties of said first layer are not impacted by exposure to an irradiation applied to said lithographic structure.

21. The lithographic structure of claim 1, wherein said second layer is a chemically amplified resist.

22. The lithographic structure of claim 1, wherein said second layer has a thickness from about 250A to about 6000A.

23. The lithographic structure of claim 1, wherein an etch selectivity of said second layer to said first layer is greater than about 1:1.

24. The lithographic structure of claim 1, wherein said lithographic structure is substantially free of interfacial interaction of said first layer and said second layer.

25. The lithographic structure of claim 1, wherein said lithographic structure has a reflectance at the interface between said first and second layers of less than about 0.01 %.

26. A method of making a lithographic structure comprising:

depositing on a surface of a substrate a first layer which comprises a water and/or aqueous base soluble material comprising Ge, O, and H, and optionally X, wherein X is at least one of Si, N, and F; and

depositing on said first layer a second layer comprising an energy photoactive material.

27. The method of claim 26, wherein said depositing of said first layer is repeated one or more times by depositing one or more of same or different layers comprising Ge, O, and H, and optionally X, wherein X is at least one of Si, N, and F.

28. The method of claim 27, wherein the index of refraction and the extinction coefficient of said first layer are finely tuned to substantially match those of said substrate at a first interface between said first layer and said substrate and to substantially match those of said second layer at a second interface between said first layer and said second layer.

29. The method of claim 26, further comprising depositing a third layer comprising an anti-reflective coating between said first layer and said second layer.

30. The method of claim 29, wherein said anti-reflective coating comprises R, C, O, and H, wherein R is selected from the group consisting of: Si, Ge, Ti and any combinations thereof.

31. The method of claim 26, further comprising depositing a fourth layer comprising a sacrificial hard mask and/or capping layer between said first layer and said substrate.

32. The method of claim 26, wherein said first layer is deposited by a technique selected from the group consisting of: vapor deposition, high density plasma, plasma enhanced chemical vapor deposition, sputtering, ion beam, electron beam, and laser assisted techniques.

33. The method of claim 26, wherein said first layer is deposited by plasma enhanced chemical vapor deposition from a precursor selected from the group consisting of: germane, alkyl germane, alkoxy germane, acyloxy germane, aryl germane, cyclic germane, silicon containing precursor, oxygen containing precursor, nitrogen containing precursor, fluorine containing precursor, sulfur containing precursor, carbon dioxide, carbon monoxide, hydrogen and any combinations thereof.

34. The method of claim 26, wherein said first layer is deposited by spin-coating.

35. The method of claim 26, wherein said first layer is deposited from a precursor selected from the group consisting of: $Ge(OR)_4$, $Si(OR)_4$, $HGe(R^1)_3$, $HSi(R^1)_3$, $HGe(OR)_3$, $HSi(OR)_3$ and any combinations thereof, wherein R is selected from the group consisting of: methyl, ethyl, isopropyl, isobutyl, n-butyl and any combinations thereof, and wherein R^1 is a halogen.

36. The method of claim 26, further comprising etching a pattern into said first layer.

37. The method of claim 36, wherein said pattern is formed by first forming a pattern in said second layer and thereafter transferring said pattern to said first layer.

38. The method of claim 37, wherein said pattern is transferred into said first layer by reactive ion etching in a plasma comprising a component selected from the group consisting of: fluorine, chlorine, bromine, fluorocarbon, oxygen, CO, CO2, nitrogen, helium, argon, hydrogen and any mixtures thereof

39. The method of claim 26, further comprising removing said first layer by water and/or aqueous base.

40. A film for a lithographic structure comprising Ge, O, and H, and optionally X, wherein X is at least one of Si, N, and F, and wherein said film is water and/or aqueous base soluble.